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ADEOS-II
Catalogue Interoperability System (CIS)
Interface Control Document (ICD)

(NASDA - NASA)

Version 1.0

January 2003

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APPROVED BY:

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Abstract

NASDA is building the Advanced Earth Observing Satellite II (ADEOS-II) to provide data from a variety of space-borne sensors.

The Earth Observation data and Information System (EOIS) is being developed by the National Space Development Agency (NASDA) of Japan for the purpose of exchanging earth observation data and information with satellite instrument providers and affiliated data centers. This data will support research by the international science community to develop a scientific basis for understanding global change.

The Earth Observing System Data and Information System (EOSDIS) has been developed by the National Aeronautics and Space Administration (NASA) of the United States for the purpose of exchanging earth observation data and information with satellite instrument providers and affiliated data centers. This data will support research by the international science community to develop a scientific basis for understanding global change.

This Interface Control Document (ICD) defines the functional and physical design of each interface between the NASDA EOIS and the NASA EOSDIS for catalogue interoperability for the ADEOS-II Project.

This ICD is consistent with the ADEOS-II Catalogue Interoperability Interface Requirements Document (NASDA-NASA).

This document is under NASDA configuration control. Changes to this document will be made by complete revision after NASDA and NASA review and approval. NASA will review and approve changes in accordance with the change control requirements described in the Earth Science Data and Information System Project Configuration Management Procedures.

Contents

1. Introduction

1.1 Scope

This ICD defines the catalog system interfaces between NASDA and NASA for ADEOS-II. In addition, it describes data flows and specifies functional requirements.

1.2 Purpose

This document is written to formalize the interpretation and general understanding of the catalog interface between the NASDA EOIS and NASA EOSDIS for the ADEOS-II project. This document provides clarification and elaboration of the NASDA-NASA interfaces to the extent necessary to assure hardware, software, and operational service compatibility within the end-to-end system.

1.3 Document Maintenance Policy

NASDA has responsibility for maintenance and configuration control of this document.

If NASDA EOIS or NASA EOSDIS finds it necessary to change this ICD, the agency will communicate the items to be changed, the reasons for the change and specific language with which to make the change (actual new wording to be entered, and the old wording to be deleted or changed) by Operation Coordination Letter (OCL) to the other agency. The agency receiving the OCL will review the request and, if both agencies agree to the change, NASDA/EOC will issue a new version of the entire ICD (not just change pages) in an OCL which will contain the entire ICD and describe all of the changes that were made. NASA will review and approve changes in accordance with the change control requirements described in the Earth Science Data and Information System Project Configuration Management Procedures.

After a new version of the ICD is released, and until it is signed by both parties, it will be referred to as a "Preliminary Version". Before a Preliminary Version ICD is signed, the current signed version will remain in effect. However, if both parties agree (i.e. if the changes are urgent), the Preliminary Version can go into effect before it is signed.

2. Related Documentation

2.1 Parent Documents

The following documents are the parents from which this document's scope and content are derived.

- Memorandum of Understanding between the National Space Development Agency of Japan (NASDA) and National Aeronautics and Space Administration (NASA) for cooperation in the Advanced Earth Observing Satellite II (ADEOS-II) Program.
- "ADEOS-II Mission Operations Implementation Plan" among NASDA, NASA and NOAA (AD2-EOC-96-055).
- Operation requirements for ADEOS-II ground segment (AD2-EOC-1995-004).
- Advanced Earth Observing Satellite II (ADEOS-II) Mission Operation Interface Specification Common Part and NASDA/NASA/NOAA part (MOIS) (AD2-EOC-97-046).
- ADEOS-II Catalogue Interoperability Interface Requirements Document (NASDA - NASA) (EOIS/AD2-ND-007)

2.2 Applicable Documents

The following documents are directly applicable to this document. The document below defines the ODL structure used to interoperate with ECS and V0 Data Centers.

- EOSDIS Information Management System, EOS Data Gateway Messages and Development Data Dictionary, (IMSV0-PD-SD-002 v3.4).

2.3 Information Documents

The following documents, although not directly applicable, amplify or clarify the information presented in this document, but are not binding.

- Earth Science Data and Information System Project Configuration Management Procedures (423-10-21).
- "ADEOS-II Compatibility Test Plan" among NASDA, NASA and NOAA.
- "ADEOS-II to Ground Stations Interface Document" for NASA Ground Stations and NOAA.
- "ADEOS-II Spacecraft Orbital Operations Handbook, Volume 11 (SeaWinds)."
- NASDA Catalogue System Site Solution.
- Goddard Space Flight Center, Earth Science Data and Information System (ESDIS) Project - Level 2 Requirements.
- EOSDIS Information Management System, EOS Data Gateway Messages and Development Data Dictionary, (IMSV0-PD-SD-002 v2.2).

3. EOIS - EOSDIS Interface

3.1 Overview

The interface between the EOIS and EOSDIS systems supports two-way catalog interoperability to provide an exchange of data and information. Specifically, this interface supports the search, location and acquisition of data between the EOIS and EOSDIS systems, providing EOIS and EOSDIS users with ready access to the data and services provided by the other system. Figure 3-1 is a high level diagram of the catalog interoperability interfaces between the EOIS and EOSDIS systems.

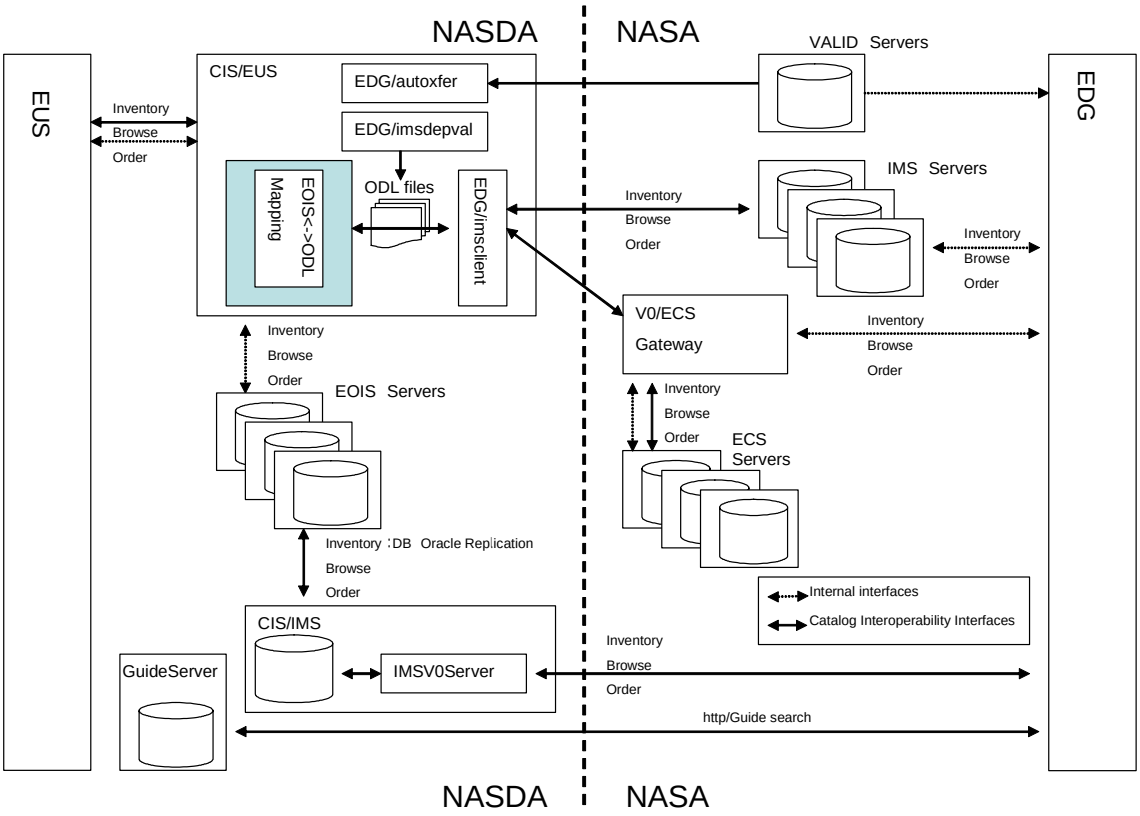

Figure 3-1. Catalog Interoperability Interfaces

The catalog interoperability data flows supported are categorized as follows:

a. Guide search request/results - for obtaining detailed information about datasets.

b. Inventory search request/results - for locating specific granules within a dataset.

c. Acknowledge - to acknowledge reception of inventory search results chunks.

d. Browse requests/results - for enabling the user to retrieve/view representative images.

e. Product Order requests/results - placement of orders for data sets.

f. Quit - notification of premature termination of a session due to problems; also used at the normal termination of inventory results exchanges of chunks.

The following sections present information about translation between the EOIS and EOSDIS systems for ADEOS-II catalog interoperability. The information for the EOSDIS system ODL messages is listed in the EOSDIS Messages and Development Data Dictionary (currently version 3.4). The EOSDIS Messages and Development Data Dictionary is one of the primary documents that define NASA internal interfaces between the EDG client, ECS Data Centers and V0 Data Centers. To the extent possible, NASA will maintain backward compatibility with earlier versions of the EOSDIS Messages and Development Data Dictionary to minimize any potential impact to NASDA's use of this document for NASDA EOIS interoperability with NASA V0 gateways at ECS and V0 Data Centers. As part of the ESDIS Project Configuration Management process, proposed changes to the EOSDIS Messages and Development Data Dictionary will be coordinated via a CCR. NASDA's impact assessment for the CCR will be taken into consideration to the extent possible. However, some changes may require NASDA to make changes in order to maintain interoperability with NASA ECS and V0 Data Centers. If necessary, this ICD and the associated OA(s) will be updated accordingly.

In some cases the information can be directly transferred (e.g. character type to character type). In some cases the information is converted (e.g. integer type to character type). In some cases the information requires more complex conversion (e.g. conversion from an EOISDIS polygon area to a rectangular area for EOIS). In some cases mapping of valids is also required (e.g. the valid for DATASET_ID in an ODL message will be mapped to a different valid value for DS_CD in a NASDA PVL message). The values of valids will change on a periodic basis according to approval by the EDG Science and Operations Group and the results of the mapping of valids values will change as the values of valids change. Current lists of EOIS and EOSDIS valids can be obtained from the contacts listed in the ADEOS-II Catalog Interoperability Operations Agreements.

3.2 Guide Search

Provides a uniform set of detailed descriptions for one or more data sets and related entities, containing information suitable for determining the location and content of each data set and its potential usefulness for a specific application.

Guide operations are performed in HTML. NASDA will install a Guide server at the EOC that will provide guide documents in response to EDG Client requests.

3.3 Inventory Search

3.3.1 CIS/EUS Inventory Search of NASA Data Centers

The NASDA EOIS cannot perform searches based on complex polygon areas. CIS/EUS will convert EOSDIS polygon areas to rectangular areas and perform EOIS inventory searches based on the resulting rectangular area.

The "Data URL", which points to the data granule in the search results, will not be supported by CIS/EUS. The EUS Client will display the Data URL to the user, but the user will not be able to gain access by "clicking" on the URL.

Subset Option will not be supported by CIS/EUS. The EUS Client will not be able to perform Granule Subsetting.

3.3.2 CIS/IMS Inventory Search of NASDA EOIS

CIS/IMS will not provide the Data URL in search results returned to the EDG Client, and thus the Data URL will not be visible to users of the EDG Client.

CIS/IMS will not return Granule Subset information in inventory results to EDG Clients and thus EDG Clients will not display information related to viewing Granule Subsetting.

3.4 Browse

The NASA V0 system presents browse data in HDF format. The NASDA EOIS system presents browse in JFIF format.

3.4.1 CIS/EUS Browse Request of NASA Data Centers

NASDA EUS clients will use an HDF plug-in image viewer capable of viewing multiple HDF browse images received from the NASA EOSDIS system. CIS/EUS will use the Integrated Browse ODL message for retrieving browse from NASA. FTP Browse will not be supported by CIS/EUS. The EUS Client will not be able to request FTP Browse.

3.4.2 CIS/IMS Browse Request of NASDA EOIS

CIS/IMS will use the jpeg2hdf NCSA tool to convert NASDA JFIF format browse to HDF format for transfer to NASA clients.

CIS/IMS will respond to Integrated Browse ODL messages received from NASA clients. FTP Browse will not be supported by CIS. CIS/IMS will not return FTP Browse information in inventory results to EDG Clients and thus EDG Clients will not display information related to viewing FTP Browse. CIS/IMS will respond to FTP Browse ODL messages from NASA clients with a failure message.

3.5 Product Order

3.5.1 CIS/EUS Product Order Request of NASA Data Centers

EUS Client will operate through CIS/EUS to order data from IMS servers. CIS/EUS will not support sending email data orders to IMS servers.

Order by Dataset and Order Cancel will not be supported by CIS. The EUS Client will not be able to perform Order by Dataset or Order Cancel.

Each DAAC has their own method of handling orders and the user will need to follow the process specified by the DAAC.

Package Information defines the options for NASA V0 product orders. Valids define options for NASDA EOIS product orders. When the EUS Client performs inventory searches to ECS and V0 IMS Servers via CIS/EUS, CIS/EUS extracts Package Information from the inventory results coming from ECS and V0 IMS Servers. CIS/EUS then converts this Package Information to Product Order valids and stores these Product Order valids in CIS/EUS (see Figure 5-1). When the user opens the Product Order Window in the EUS Client to order non-NASDA data, the EUS Client software sends a VALID_REQUEST message to CIS/EUS. CIS/EUS responds by sending a VALID_RESULT message to the EUS Client. The CIS/EUS will not send email orders to the DAAC IMS servers.

EOSDIS utilizes 3 profiles (Billing Address, Contact Address and the Shipping Address) in an ECS or V0 IMS product order. EOIS uses 1 profile in an EOIS product order. When the EUS Client is used to order products from NASA, CIS/EUS receives the Contact Address and Shipping Address from the EUS Client and always uses the NASDA Order Desk as the Billing Address (see Figure 3-2).

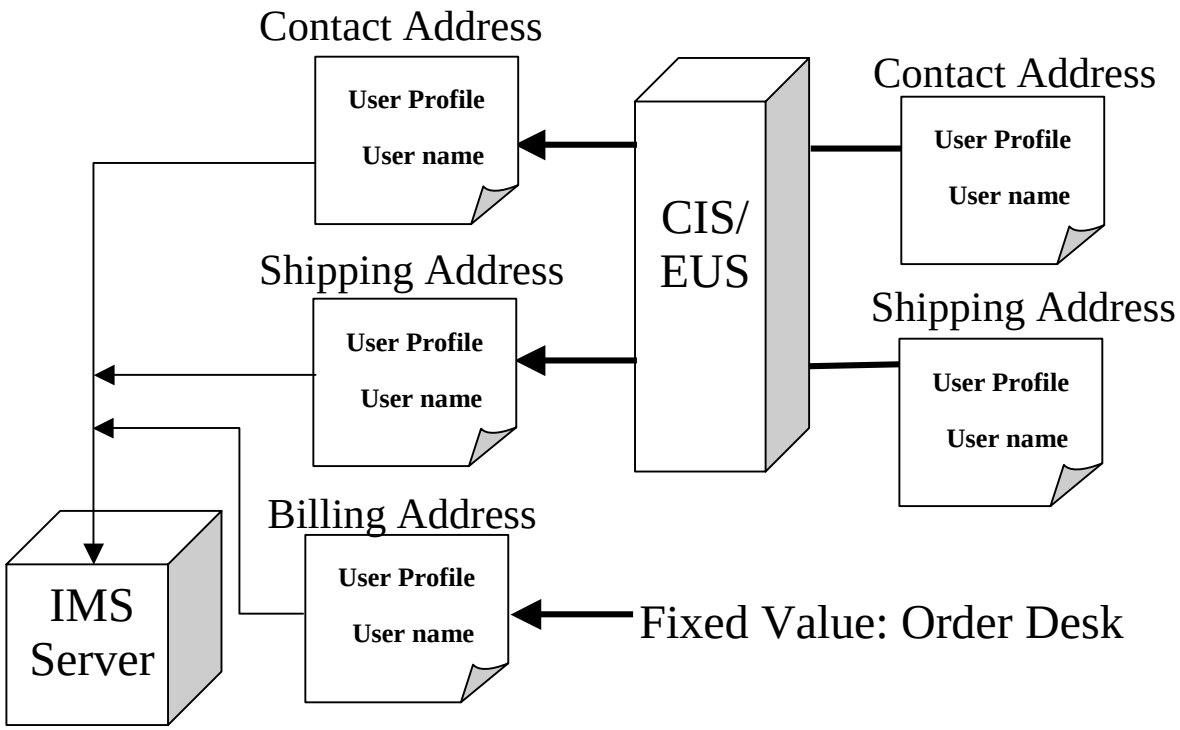

Figure 3-2. User Profiles for Product Order from the EUS Client

3.5.2 CIS/IMS

NASA-sponsored users who are requesting data for Research, Applications, or Operational Use for the Public Benefit, who are approved to receive free data by NASDA, will be given an account and a user ID by NASDA. These users can then use the EDG Client to order data from NASDA via the CIS/IMS and their data orders will be filled, to the limit of their established account, directly by NASDA.

Users who have not been approved by NASDA, and who therefore do not have an established account with NASDA, can use the EDG Client to order data via the CIS/IMS. Their orders will be forwarded by the NASDA data order system to RESTEC, and RESTEC will contact the user to arrange payment for the data.

Order by Dataset will not be supported by CIS. CIS/IMS will not return Dataset Order information in inventory results to EDG Clients and thus EDG Clients will not display information related to viewing Order by Dataset.

Order Cancel will not be supported by CIS. CIS/IMS will not perform an Order Cancel when requested by an EDG Client. CIS/IMS will respond to an Order Cancel request by an EDG Client by returning an error.

CIS/IMS obtains valids information from EOIS servers, maps this valids information into Dynamic Package Information format and inserts this into Inventory Results messages dynamically.

EOSDIS utilizes 3 profiles (Billing Address, Contact Address and the Shipping Address) in an IMS product order. EOIS uses 1 profile in an EOIS product order. When the EDG Client is used to order products from NASDA, CIS/IMS selects the Contact Address for NASDA billing and the Shipping Address is obtained from the User Profile information held at the EOC (see Figure 3-3).

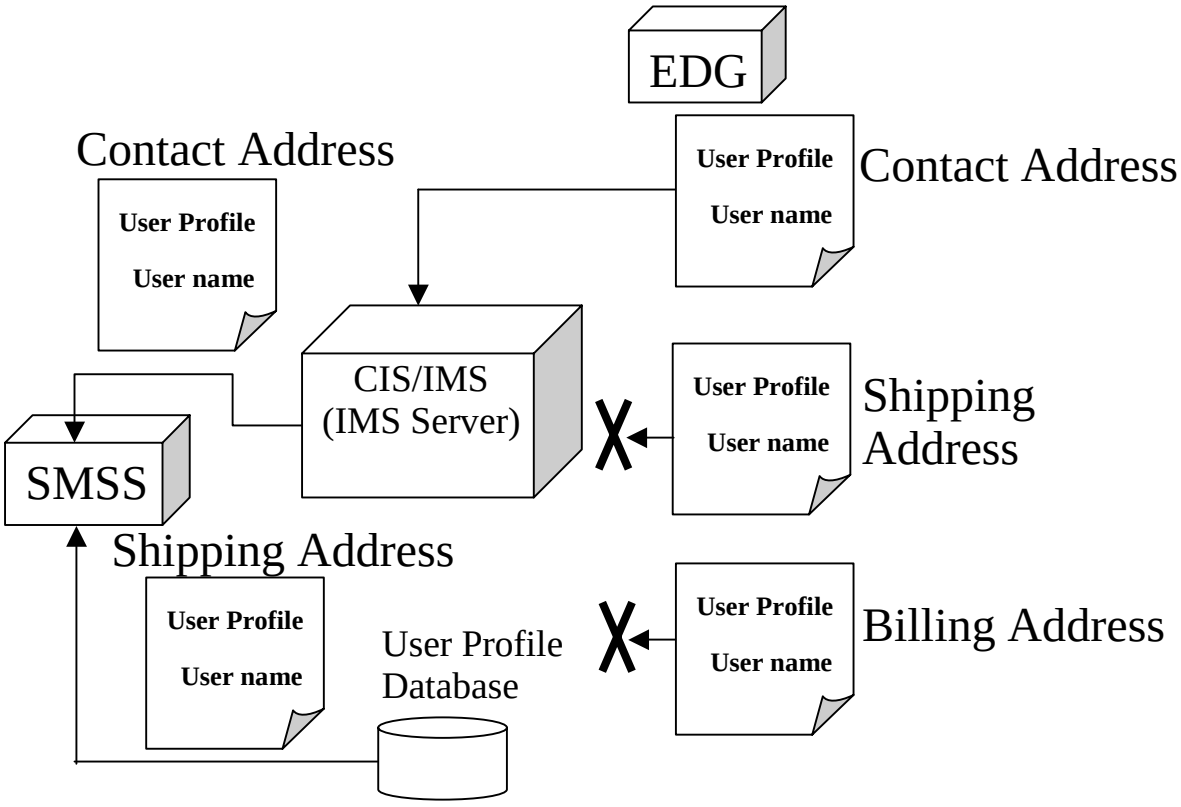

Figure 3-3. User Profiles for Product Order from the EDG Client.

4. CIS/EUS ODL

This section lists the ODL that is sent between CIS/EUS and NASA V0 IMS servers and the ECS V0 Gateway. ODL supported by CIS/IMS is not listed. CIS/IMS uses the IMS V0 Server Software supplied by NASA and supports ODL according to the version of the NASA software currently installed.

4.1 ODL for Inventory Search

Table 4-1 lists the ODL supported by CIS/EUS for INVENTORY_SEARCH. A + sign indicates a group name and [ ] brackets indicate an optional item. The Impact column is a rough indication of the impact on the software if the ODL for this item is changed: 1 = major impact, 2 = medium impact, 3 = low impact, 0 = no impact.

Table 4-1. ODL for INVENTORY_SEARCH

ODL	ODL Group	Impact
+INVENTORY_SEARCH		-
[AUTHENTICATOR]	INVENTORY_SEARCH	2
[BROWSE_ONLY]	INVENTORY_SEARCH	3
[CAMPAIGN]	INVENTORY_SEARCH	2
[CLOUD_COVERAGE]	INVENTORY_SEARCH	3
[DATA_CENTER_ID]	INVENTORY_SEARCH	2
[DATASET_ID]	INVENTORY_SEARCH	1
[ECS_AUTHENTICATOR]	INVENTORY_SEARCH	2
[+POINT_LOC]	INVENTORY_SEARCH	-
LATITUDE	POINT_LOC	2
LONGITUDE	POINT_LOC	2
[+RANGE_LOC]	INVENTORY_SEARCH	-
EAST_LONGITUDE	RANGE_LOC	2
NORTH_LATITUDE	RANGE_LOC	2
SOUTH_LATITUDE	RANGE_LOC	2
WEST_LONGITUDE	RANGE_LOC	2
GRANULE_LIMIT	INVENTORY_SEARCH	3
MESSAGE_ID	INVENTORY_SEARCH	0
+MONITOR	INVENTORY_SEARCH	-
TX_CLIENT	MONITOR	3
[PARAMETER~1]	INVENTORY_SEARCH	1
[PROCESSING_LEVEL]	INVENTORY_SEARCH	2
[SENSOR_NAME]	INVENTORY_SEARCH	1
[SOURCE_NAME]	INVENTORY_SEARCH	1
[START_DATE]	INVENTORY_SEARCH	2
[START_DAY_OF_YEAR]	INVENTORY_SEARCH	2
[STOP_DATE]	INVENTORY_SEARCH	2
[STOP_DAY_OF_YEAR]	INVENTORY_SEARCH	2
+VERSION	INVENTORY_SEARCH	-
PROTOCOL_VERSION	VERSION	3
SENDER_VERSION	VERSION	3

4.2 ODL for Inventory Results

Table 4-2 lists the ODL supported by CIS/EUS for INVENTORY_RESULT. A + sign indicates a group name and [ ] brackets indicate an optional item. The Impact column is a rough indication of the impact on the software if the ODL for this item is changed: 1 = major impact, 2 = medium impact, 3 = low impact, 0 = no impact.

Table 4-2. ODL for INVENTORY_RESULT

ODL	ODL Group	Impact
+INVENTORY_RESULT		-
DATA_CENTER_ID	INVENTORY_RESULT	2
+DATASET~1	INVENTORY_RESULT	-
[BROWSE_PRODUCT_DESCRIPTION]	DATASET~1	0
[+BROWSE_URL]	DATASET~1	-
URL	BROWSE_URL	0
URL_COMMENT	BROWSE_URL	0
[CAMPAIGN]	DATASET~1	0
[COMMENT]	DATASET~1	0
[+DATASET_HOME_PAGE]	DATASET~1	-
URL	DATASET_HOME_PAGE	0
URL_COMMENT	DATASET_HOME_PAGE	0
DATASET_ID	DATASET~1	2
[+DATA_URL]	DATASET~1	-
URL	DATA_URL	0
URL_COMMENT	DATA_URL	0
[DAY_NIGHT]	DATASET~1	0
[EXTENDED_CRITERIA_USED]	DATASET~1	0
[+GRANULE]	DATASET~1	-
[BROWSE_TYPE]	GRANULE	2
[+BROWSE_URL]	GRANULE	-
URL	BROWSE_URL	0
URL_COMMENT	BROWSE_URL	0
[CAMPAIGN]	GRANULE	0
[COMMENT]	GRANULE	0
[+DATA_URL]	GRANULE	-
URL	DATA_URL	0
URL_COMMENT	DATA_URL	0
[DAY_NIGHT]	GRANULE	0
GLOBAL_GRANULE	GRANULE	0
+POINT_LOC	GRANULE	-
LATITUDE	POINT_LOC	2
LONGITUDE	POINT_LOC	2
+POLYGON_LOC~2	GRANULE	-
CENTROID_LAT	POLYGON_LOC~2	2
CENTROID_LON	POLYGON_LOC~2	2
LATITUDE	POLYGON_LOC~2	2
LONGITUDE	POLYGON_LOC~2	2

[POLE_INCLUDED]	POLYGON_LOC~2	0
+RANGE_LOC	GRANULE	-
EAST_LONGITUDE	RANGE_LOC	2
NORTH_LATITUDE	RANGE_LOC	2
SOUTH_LATITUDE	RANGE_LOC	2
WEST_LONGITUDE	RANGE_LOC	2
GRANULE_ID	GRANULE	2
[INTEGRATED_BROWSE_ONLY]	GRANULE	2
[PACKAGE_ID]	GRANULE	2
[PARAMETER~1]	GRANULE	0
[+PATH_ROW_LOC]	GRANULE	-
PATH	PATH_ROW_LOC	0
ROW	PATH_ROW_LOC	0
WRS_TYPE	PATH_ROW_LOC	0
[PROCESSING_LEVEL]	GRANULE	0
[SENSOR_NAME]	GRANULE	2
[SOURCE_NAME]	GRANULE	2
[+SPECIALIZED_RESULTS]	GRANULE	-
RESULT_NAME	SPECIALIZED_RESULTS	0
RESULT_VALUE	SPECIALIZED_RESULTS	0
START_DATE	GRANULE	2
STOP_DATE	GRANULE	2
[MD_ENTRY_ID]	DATASET~1	0
[+MISC_URL]	DATASET~1	-
URL	BROWSE_URL	0
URL_COMMENT	MISC_URL	0
[NUMBER_OF_GRANULE_HITS]	DATASET~1	0
[+PACKAGE]	DATASET~1	-
COMMENT	PACKAGE	0
DATASET_ID	PACKAGE	2
[+DATASET_ORDER_OPTIONS]	PACKAGE	-
[REQUIRED]	DATASET_ORDER_OPTIONS	0
[+ORDER_OPTIONS]	PACKAGE	-
[REQUIRED]	ORDER_OPTIONS	0
PACKAGE_ID	PACKAGE	2
+PROCESSING_OPTIONS	PACKAGE	-
OPTION_ID	PROCESSING_OPTIONS	2
+MEDIA_TYPE~1	PROCESSING_OPTIONS	-
TYPE_ID	MEDIA_TYPE~1	2
+MEDIA_FORMAT~1	MEDIA_TYPE~1	-
FORMAT_ID	MEDIA_FORMAT~1	2
[+SUBSET_OPTIONS]	PACKAGE	-
[REQUIRED]	SUBSET_OPTIONS	0
[PACKAGE_ID]	DATASET~1	2

[PARAMETER~1]	DATASET~1	2
[PROCESSING_LEVEL]	DATASET~1	0
[RESTRICTION]	DATASET~1	0
[SENSOR_NAME]	DATASET~1	2
[SOURCE_NAME]	DATASET~1	2
[SPECIALIZED_SEARCH_URL]	DATASET~1	0
STATUS_CODE	DATASET~1	0
[VALID_ACCOUNT]	DATASET~1	0
MESSAGE_ID	INVENTORY_RESULT	0
+MONITOR	INVENTORY_RESULT	0
TX_CLIENT	MONITOR	0
[+PACKAGE]	DATASET~1	-
COMMENT	PACKAGE	0
DATASET_ID	PACKAGE	2
[+DATASET_ORDER_OPTIONS]	PACKAGE	-
[REQUIRED]	DATASET_ORDER_OPTIONS	0
[+ORDER_OPTIONS]	PACKAGE	-
[REQUIRED]	ORDER_OPTIONS	0
PACKAGE_ID	PACKAGE	2
+PROCESSING_OPTIONS	PACKAGE	-
OPTION_ID	PROCESSING_OPTIONS	2
+MEDIA_TYPE~1	PROCESSING_OPTIONS	-
TYPE_ID	MEDIA_TYPE~1	2
+MEDIA_FORMAT~1	MEDIA_TYPE~1	-
FORMAT_ID	MEDIA_FORMAT~1	2
[+SUBSET_OPTIONS]	PACKAGE	-
[REQUIRED]	SUBSET_OPTIONS	0
[UNMAPPED_FIELD]	INVENTORY_RESULT	0
[+VERSION]	INVENTORY_RESULT	-
PROTOCOL_VERSION	VERSION	0
SENDER_VERSION	VERSION	0

4.3 ODL for Browse Request

Table 4-3 lists the ODL supported by CIS/EUS for BROWSE_REQUEST. A + sign indicates a group name and [ ] brackets indicate an optional item. The Impact column is a rough indication of the impact on the software if the ODL for this item is changed: 1 = major impact, 2 = medium impact, 3 = low impact, 0 = no impact.

Table 4-3. ODL for BROWSE_REQUEST

ODL	ODL Group	Impact
+BROWSE_REQUEST		-
[AUTHENTICATOR]	BROWSE_REQUEST	2
+BROWSE_GRANULES	BROWSE_REQUEST	-
DATASET_ID	BROWSE_GRANULES	1
GRANULE_ID	BROWSE_GRANULES	2

BROWSE_TYPE	BROWSE_REQUEST	3
+CONTACT_ADDRESS	BROWSE_REQUEST	-
ADDRESS	CONTACT_ADDRESS	0
CITY	CONTACT_ADDRESS	0
COUNTRY	CONTACT_ADDRESS	0
EMAIL	CONTACT_ADDRESS	0
[FAX]	CONTACT_ADDRESS	0
FIRST_NAME	CONTACT_ADDRESS	0
LAST_NAME	CONTACT_ADDRESS	0
[MIDDLE_INITIAL]	CONTACT_ADDRESS	0
[ORGANIZATION]	CONTACT_ADDRESS	0
PHONE	CONTACT_ADDRESS	0
[STATE]	CONTACT_ADDRESS	0
[TITLE]	CONTACT_ADDRESS	0
[ZIP]	CONTACT_ADDRESS	0
DATA_CENTER_ID	BROWSE_REQUEST	2
[ECS_AUTHENTICATOR]	BROWSE_REQUEST	2
MESSAGE_ID	BROWSE_REQUEST	0
+MONITOR	BROWSE_REQUEST	-
TX_CLIENT	MONITOR	3
+VERSION	BROWSE_REQUEST	-
PROTOCOL_VERSION	VERSION	3
SENDER_VERSION	VERSION	3

4.4 ODL for Integrated Browse Results

Table 4-4 lists the ODL supported by CIS/EUS for INTEGRATED_BROWSE_RESULT. A + sign indicates a group name and [ ] brackets indicate an optional item. The Impact column is a rough indication of the impact on the software if the ODL for this item is changed: 1 = major impact, 2 = medium impact, 3 = low impact, 0 = no impact.

Table 4-4. ODL for INTEGRATED_BROWSE_RESULT

ODL	ODL Group	Impact
+INTEGRATED_BROWSE_RESULT		-
DATA_CENTER_ID	INTEGRATED_BROWSE_RESULT	2
+IMAGE	INTEGRATED_BROWSE_RESULT	-
DATASET_ID	IMAGE	2
GRANULE_ID	IMAGE	2
MESSAGE_ID	INTEGRATED_BROWSE_RESULT	0
+MONITOR	INTEGRATED_BROWSE_RESULT	0
TX_CLIENT	MONITOR	0
STATUS_CODE	INTEGRATED_BROWSE_RESULT	0
[+VERSION]	INTEGRATED_BROWSE_RESULT	-
PROTOCOL_VERSION	VERSION	0
SENDER_VERSION	VERSION	0

4.5 ODL for Product Request

Table 4-5 lists the ODL supported by CIS/EUS for PRODUCT_REQUEST. A + sign indicates a group name and [ ] brackets indicate an optional item. The Impact column is a rough indication of the impact on the software if the ODL for this item is changed: 1 = major impact, 2 = medium impact, 3 = low impact, 0 = no impact.

Table 4-5. ODL for PRODUCT_REQUEST

ODL	ODL Group	Impact
+PRODUCT_REQUEST		-
[AUTHENTICATOR]	PRODUCT_REQUEST	2
[+BILLING_ADDRESS]	PRODUCT_REQUEST	-
[ADDRESS]	BILLING_ADDRESS	0
CITY	BILLING_ADDRESS	0
COUNTRY	BILLING_ADDRESS	0
[EMAIL]	BILLING_ADDRESS	0
[FAX]	BILLING_ADDRESS	0
FIRST_NAME	BILLING_ADDRESS	0
LAST_NAME	BILLING_ADDRESS	0
[MIDDLE_INITIAL]	BILLING_ADDRESS	0
[ORGANIZATION]	BILLING_ADDRESS	0
PHONE	BILLING_ADDRESS	0
[STATE]	BILLING_ADDRESS	0
[TITLE]	BILLING_ADDRESS	0
[ZIP]	BILLING_ADDRESS	0
+CONTACT_ADDRESS	PRODUCT_REQUEST	-
ADDRESS	CONTACT_ADDRESS	0
CITY	CONTACT_ADDRESS	0
COUNTRY	CONTACT_ADDRESS	0
EMAIL	CONTACT_ADDRESS	0
[FAX]	CONTACT_ADDRESS	0
FIRST_NAME	CONTACT_ADDRESS	0
LAST_NAME	CONTACT_ADDRESS	0
[MIDDLE_INITIAL]	CONTACT_ADDRESS	0
[ORGANIZATION]	CONTACT_ADDRESS	0
PHONE	CONTACT_ADDRESS	0
[STATE]	CONTACT_ADDRESS	0
[TITLE]	CONTACT_ADDRESS	0
[ZIP]	CONTACT_ADDRESS	0
DATA_CENTER_ID	PRODUCT_REQUEST	0
[ECS_AUTHENTICATOR]	PRODUCT_REQUEST	2
REQUEST_ID~1	PRODUCT_REQUEST	2
+LINE_ITEM	PRODUCT_REQUEST	-
DATASET_ID	LINE_ITEM	2
MEDIA_FORMAT	LINE_ITEM	2
MEDIA_TYPE	LINE_ITEM	2
PACKAGE_ID	LINE_ITEM	2

PROCESSING_OPTIONS	LINE_ITEM	2
MESSAGE_ID	PRODUCT_REQUEST	3
+MONITOR	PRODUCT_REQUEST	-
TX_CLIENT	MONITOR	3
[+SHIPPING_ADDRESS]	PRODUCT_REQUEST	-
[ADDRESS]	SHIPPING_ADDRESS	0
CITY	SHIPPING_ADDRESS	0
COUNTRY	SHIPPING_ADDRESS	0
[EMAIL]	SHIPPING_ADDRESS	0
[FAX]	SHIPPING_ADDRESS	0
FIRST_NAME	SHIPPING_ADDRESS	0
LAST_NAME	SHIPPING_ADDRESS	0
[MIDDLE_INITIAL]	SHIPPING_ADDRESS	0
[ORGANIZATION]	SHIPPING_ADDRESS	0
PHONE	SHIPPING_ADDRESS	0
[STATE]	SHIPPING_ADDRESS	0
[TITLE]	SHIPPING_ADDRESS	0
[ZIP]	SHIPPING_ADDRESS	0
+USER_AFFILIATION	PRODUCT_REQUEST	-
CATEGORY	USER_AFFILIATION	3
TYPE	USER_AFFILIATION	2
+VERSION	PRODUCT_REQUEST	-
PROTOCOL_VERSION	VERSION	3
SENDER_VERSION	VERSION	3

4.6 ODL for Product Results

Table 4-6 lists the ODL supported by CIS/EUS for PRODUCT_RESULT. A + sign indicates a group name and [ ] brackets indicate an optional item. The Impact column is a rough indication of the impact on the software if the ODL for this item is changed: 1 = major impact, 2 = medium impact, 3 = low impact, 0 = no impact.

Table 4-6. ODL for PRODUCT_RESULT

ODL	ODL Group	Impact
+PRODUCT_RESULT		-
MESSAGE_ID	PRODUCT_RESULT	0
DATA_CENTER_ID	PRODUCT_RESULT	0
STATUS_CODE	PRODUCT_RESULT	0
+MONITOR	PRODUCT_RESULT	0
TX_CLIENT	MONITOR	0
+DAAC_CONTACT_ADDRESS	PRODUCT_RESULT	0
CONTACT_NAME	DAAC_CONTACT_ADDRESS	0
ORGANIZATION	DAAC_CONTACT_ADDRESS	0
CITY	DAAC_CONTACT_ADDRESS	0
COUNTRY	DAAC_CONTACT_ADDRESS	0
PHONE	DAAC_CONTACT_ADDRESS	0

+VERSION	PRODUCT_RESULT	-
PROTOCOL_VERSION	VERSION	0
SENDER_VERSION	VERSION	0

4.7 ODL for ACKNOWLEDGE

Table 4-7 lists the ODL supported by CIS/EUS for ACKNOWLEDGE. A + sign indicates a group name and [ ] brackets indicate an optional item. The Impact column is a rough indication of the impact on the software if the ODL for this item is changed: 1 = major impact, 2 = medium impact, 3 = low impact, 0 = no impact.

Table 4-7. ODL for ACKNOWLEDGE

ODL	ODL Group	Impact
+ACKNOWLEDGE		-
[MESSAGE_ID]	ACKNOWLEDGE	0
+MONITOR	ACKNOWLEDGE	0
TX_CLIENT	MONITOR	0
[+VERSION]	ACKNOWLEDGE	-
PROTOCOL_VERSION	VERSION	0
SENDER_VERSION	VERSION	0

4.8 ODL FOR QUIT

Table 4-8 lists the ODL supported by CIS/EUS for QUIT. A + sign indicates a group name and [ ] brackets indicate an optional item. The Impact column is a rough indication of the impact on the software if the ODL for this item is changed: 1 = major impact, 2 = medium impact, 3 = low impact, 0 = no impact.

Table 4-8. ODL for QUIT

ODL	ODL Group	Impact
+QUIT		-
[AUTHENTICATOR]	QUIT	0
[DATA_CENTER_ID]	QUIT	0
[ECS_AUTHENTICATOR]	QUIT	0
MESSAGE_ID	QUIT	0
+MONITOR	QUIT	0
TX_CLIENT	MONITOR	0
STATUS_CODE	QUIT	0
[+VERSION]	QUIT	-
PROTOCOL_VERSION	VERSION	0
SENDER_VERSION	VERSION	0

4.9 Allowable Nesting Depth for ODL

EDG does not have any limit to the depth of the ODL message nesting structure. However, NASDA has established a limit of 10 to the depth of the CIS/EUS message nesting structure, in the case of the seven core attributes, in order to make CIS/EUS more stable. The depth of nesting of ODL messages between ECS servers, V0 IMS servers and CIS/EUS should not exceed this limitation.

4.10 Allowable Characters for ODL

ODL is structured as KEYWORD = VALUE. Table 4-7 lists the characters that may be used in the VALUE portion of ODL.

Table 4-7. Allowable Characters for ODL

Allowable Characters in ODL			
Alphabet [A to Z, a to z]	\	=	.
Numeric [0 to 9]	/	+	:
#	( )	!	;
%	[ ]	|	`
$	{ }	?	‘
*	< >	@	
&	-	,	

ODL message numeric values are indicated by numbers, and are not enclosed by double or single quotes (e.g. KEYWORD = 10.0). The allowable characters are 0 to 9, + sign, - sign and decimal point. Note that the – sign is an allowable character for numeric values, but is not an allowable character for numeric strings (see Table 4-7).

4.11 Anticipating Future Changes to ODL

The Object Description Language (ODL) is a language used to encode data labels between NASA data systems. It is an ASCII-based parameter = value language used for the storage and exchange of satellite metadata and defines the message structure used in the base V0 protocol being used by the IMS System.

Additional objects/groups can be added from time-to-time as additional capabilities are added to existing NASA EOSDIS clients and servers. In an effort to maintain backwards compatibility, effort is being made by NASA to make these extensions optional so that they may be ignored by clients or servers that do not need them.

Information about possible future changes to ODL is being included in this ICD in Appendix A as a general guide to assist in designing software that will not fail when changes are made to the ODL.

5. Valids

5.1 Offline flow of valids from NASDA to NASA

When NASDA valids change, NASDA reformats their valids to EDG Client format and PUTs the valids to NASA via FTP. NASA previews valids for standards compliance and consistency, then combines the NASA valids with NASDA valids and valids from other agencies (e.g. DLR) to create a single set of combined NASA/NASDA/other agency (CINTEX) valids. The EDG Client, via Autoxfer software, can download these valids as inventory valids.

5.2 Offline flow of valids from NASA to NASDA

Periodically (e.g. every two weeks) NASDA obtains a combined set of NASA/NASDA/other agency (e.g. DLR) valids from NASA via Autoxfer software. NASDA then reformats these valids to EUS Client format and places them on an EOIS server. The EUS Client can then obtain inventory and browse valids from the EOIS server.

5.3 Procedure for EUS Client to obtain valids

The EUS Client obtains inventory, browse and (for NASDA data) product order valids from the EOIS valids server. When the EUS Client software is started it contacts the DDS server at the EOC. At that time the EUS Client informs the DDS server of the date and time when valids were last obtained. If new valids are available the inventory, browse and (for NASDA data) product order valids are downloaded to the EUS Client at this time.

When the EUS Client performs inventory searches to ECS and V0 IMS Servers via CIS/EUS, CIS/EUS extracts Package Information from the inventory results coming from the ECS and V0 IMS Servers. CIS/EUS then converts this Package Information to Product Order valids and stores these Product Order valids in CIS/EUS (see Figure 5-1). When the user opens the Product Order Window in the EUS Client to order non-NASDA data, the EUS Client software sends a VALID_REQUEST message to CIS/EUS. CIS/EUS responds by sending a VALID_RESULT message to the EUS Client.

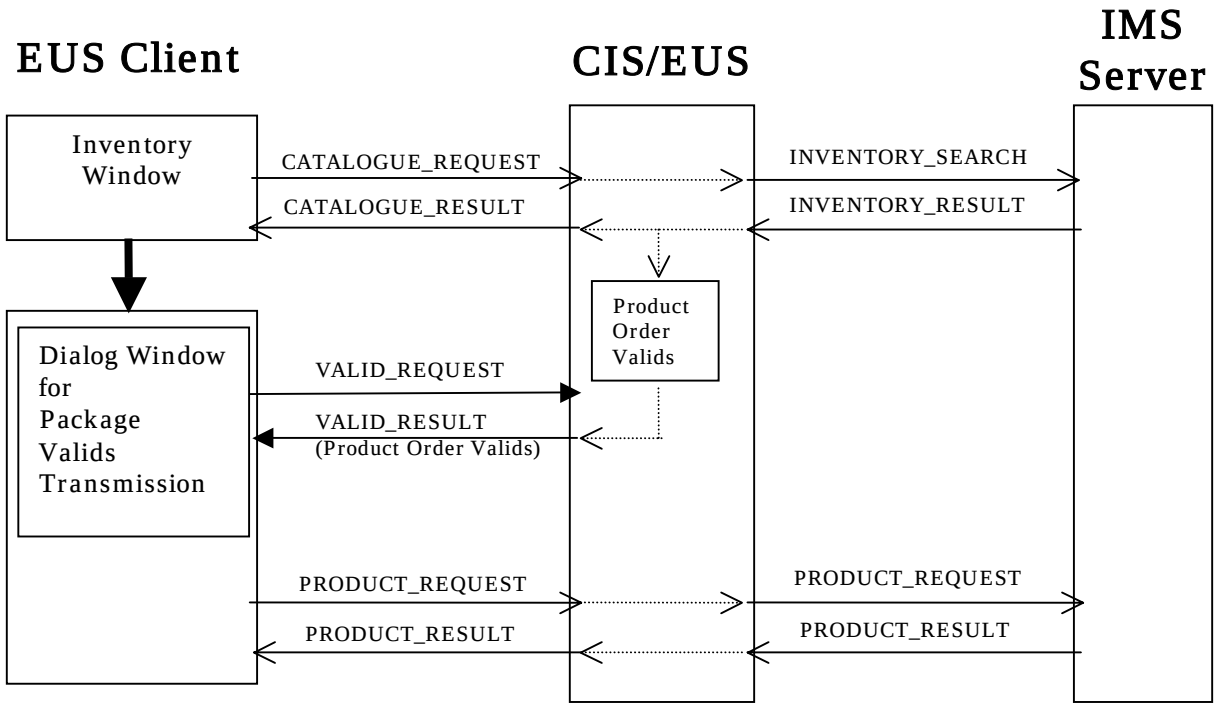

Figure 5-1. Conversion from Package Information to EUS Valids

5.4 Procedure for EDG Client to obtain valids

The EDG Client obtains inventory search valids from a NASA inventory search valids server via Autoxfer software. The EDG Client does not utilize browse valids.

CIS/IMS obtains valids information from EOIS servers, maps this valids information into Dynamic Package Information format and inserts this into Inventory Results messages dynamically.

6. Authentication

6.1 Authentication

The interface between CIS and NASA's EOSDIS system (V0 IMS and ECS) is, essentially, entirely V0 IMS. Thus, CIS will satisfy IMS authentication requirements. The EUS Client operates through CIS/EUS and CIS/EUS will send messages containing V0 IMS and ECS authentication information. When EDG Clients contact CIS/IMS, CIS/IMS will receive EDG Client authentication information and perform operations according to the users' type and level of authentication. Mapping of authentication information is shown in the figures in Section 3.

6.1.1 EUS Client

The EUS Client has windows to enter:

First Name
Last Name
V0 Data Access Key (AUTHENTICATION_KEY)
ECS User Name
ECS Password

The user can select for this information to be saved in a user profile file. CIS will then use this information to calculate the AUTHENTICATOR for V0 access and the ECS_AUTHENTICATOR for ECS access. CIS/EUS will place the AUTHENTICATOR and ECS_AUTHENTICATOR values in outgoing ODL messages.

The user may have different V0 Data Access Key (AUTHENTICATION_KEY) values for different DAACs. At the time of the order the user will need to enter the appropriate V0 Data Access Key value for the DAAC from which data is being ordered.

6.1.2 EDG Client

CIS/IMS will perform inventory search, browse retrieval and data order of NASDA data for EDG Clients. CIS/IMS will insert default authentication codes that will allow EDG Client users to perform inventory searches and retrieve browse at the EOC without registering or performing a log-in. However, NASA users must register with NASDA to order data from NASDA. When a NASA user registers with NASDA the NASA user will be given a User Code that is required to order data. When the user wishes to order data he can enter the NASDA User Code in the EDG Client in the space marked NASDA Data Access Key. The EDG Client will then calculate the NASDA_AUTHENTICATOR. When this NASDA_AUTHENTICATOR value is received by CIS/IMS it will be used in a lookup table to identify the information needed to authenticate the person for data purchase in the EOIS system.

6.2 EOSDIS Authentication

Certain NASA data servers require special authentication information to enable ordering of data from that server. At the time this ICD was written, special authentication information needed for data ordering is required by only one server, the Alaska SAR Facility (ASF) server.

6.2.1 Version 0 Data Server Authentication

The CIS/IMS will support NASA Version 0 data server authentication for ASF. When any user needs to order data from ASF, he must first open an account at ASF. When an account is opened, ASF will issue to the user a special data access "key". When the user wishes to order data from ASF, the user must provide this access key via the client. The client uses this information to calculate an AUTHENTICATOR string by using a hash of AUTHENTICATION_KEY (the entered data access key), FIRST_NAME and LAST_NAME. The generated AUTHENTICATOR string is sent out with all Version 0 messages.

User account information is the critical requirement for submitting orders to ASF. If a valid AUTHENTICATOR is sent with an inventory search, the needed account information is sent back with the inventory results to the client. The server will send back multiple account information if more than one account exists. The user should then select the appropriate account to use when ordering. If this account information is not available the user cannot order data from ASF.

6.2.2 ECS Authentication

ECS data servers have their own authentication. Unlike the Version 0 (ASF) server, however, this information is not required for a user to submit an order for data. Authentication is carried out via the ECS_AUTHENTICATOR string. ECS_AUTHENTICATOR is generated on the client by a special algorithm (supplied by ECS) that requires the user's ECS username and password. A user must be registered in the ECS system to have a username and password.

If no ECS_AUTHENTICATOR is generated (e.g. the user is not registered with ECS), searches and orders can still be submitted to ECS. Internal to ECS, these searches and orders will be seen as coming from a "guest" rather than from a registered user.

Appendix A. Example of Possible Future Change to ODL

Shown below is an ODL example of a potential new group that could appear in an Inventory Result message.

```
GROUP                    = INVENTORY_RESULT
  DATA_CENTER_ID         = "STUB"
  STATUS_CODE            = 1
  MESSAGE_ID             = "M837797641"
  GROUP                  = MEDIA_MAXIMUM_CAPACITY
    MEDIA_MB_CAPACITY    = 1
    REQUEST_SIZE_MB      = 1
    TYPE_ID              = "CD-ROM"
    COMMENT              = "Media Capacity"
    GROUP                = MISC_URL
      URL                = "http://edc.gov/l7mediacapacity.html"
      URL_COMMENT        = "Media Maximum Capacity"
    END_GROUP            = MISC_URL
  END_GROUP              = MEDIA_MAXIMUM_CAPACITY
(Etc. - rest of Inventory Result group.)
```

This new group represents the maximum granule size per media and maximum order size per media in megabytes.

“MEDIA_MB_CAPACITY = 1” means that the maximum granule size in megabytes is set to 1.

“REQUEST_SIZE_MB = 1” means that the maximum that can be ordered in a single order is 1 Megabyte.

“TYPE_ID = "CD-ROM"” means that this limit applies to the "CD-ROM" media type.

The client, on receiving such an inventory response, has two options. It can ignore these new groups and continue processing the remaining inventory result, or it can parse the new group and display it to the user (configuration of these new groups can be done via an external configuration file that can be updated with the names of new groups that need to be displayed to the user, without requiring changes to software).

Ignoring the group may cause the failure of other messages that may be dependant on the content of this new group. When a user selects a data granule for order, the client checks this granule/package correlation, then searches through its package database for information on those packages containing the selected data granule. If the client has ignored the new group, the package database for this granule would be missing this information. If the granule is too large for the media, or if there are more granules than would fit on the media, the order will fail.

This information may help to develop software that can dynamically accommodate new groups that can appear in Inventory or Product (and possibly other ODL message types) requests and responses in a robust manner. Code changes can be reduced if ODL information can be externally configured, without hard-coding group names.

Abbreviations and Acronyms

ADEOS-II	Advanced Earth Observing Satellite II
AMSR	Advanced Microwave Scanning Radiometer
AMSR-E	Advanced Microwave Scanning Radiometer-E
CCR	Configuration Change Request
DAAC	Distributed Active Archive Center
DDS	Data Distribution Subsystem
EOIS	Earth Observation Data and Information System (NASDA)
EOSDIS	Earth Observing System Data and Information System
FTP	File Transfer Protocol
GCMD	Global Change Master Directory
GSFC	Goddard Space Flight Center
EOC	Earth Observation Center (NASDA - Hatoyama, Japan)
HTML	HyperText Markup Language
ICD	Interface Control Document
V0 IMS	Version 0 Information Management System
IRD	Interface Requirements Document
MOIS	Mission Operation Interface Specification
NASA	National Aeronautics and Space Administration
NASDA	National Space Development Agency of Japan
NESDIS	National Environmental Satellite Data and Information Service
NOAA	National Oceanic and Atmospheric Administration